| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/538,132 | 03/29/2000 | Heng Liao | 16491-002710US | 6523 |

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| EXAMINER |
|---|
| EL CHANTI, HUSSEIN A |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2157 | 4 |

DATE MAILED: 08/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

| **Office Action Summary** | **Application No.** 09/538,132 | **Applicant(s)** LIAO, HENG | |
|---|---|---|---|
| | **Examiner** Hussein A El-chanti | **Art Unit** 2157 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on _29 March 2000_ .

2a)☐ This action is **FINAL**.      2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) _1-54_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-54_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____ .

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _2,3_ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____ .

## DETAILED ACTION

1.      This action is responsive to application filed on March 29, 2000. Claims 1-54 are

pending examination.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2.      Claim 11 is rejected under 35 U.S.C. 102(e) as being anticipated by Riddle et al.,

U.S. Patent No. 6,457,051 (referred to hereafter as Riddle).

Riddle teaches a method for classifying data packets comprising the steps of:

providing one or more regular expressions, each having an associated

class identifier (see Table 3 and fig. 4A);

receiving plural data packets, each having a length not necessarily equal

to one another (see claim 1); and

for each data packet, determining a matching one of said regular

expressions that matches said data packet, wherein said each data packet is classified

according to the class identifier associated with said matching regular expression (see

Table 3 and claim 1).

## *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3.      Claims 1, 2, 4 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Riddle in view of Tang, U.S. Patent No. 5,378,126.

As to claim 1, Riddle teaches a method for classifying received network data

comprising scanning incoming data wherein said network data is treated as a stream of

input bytes (see col. 2 lines 21-27), said network data being organized into data packets

(see claim 1), said scanning resulting in the identification of a data packet belonging to

one of a plurality of classes (see claim 1).

Riddle doesn't teach the limitation "scanning data network using lexical token

scanning". However Tang teaches scanning data using lexical token scanning (see

abstract, statements in a program are lexically scanned and parsed into a parse tree).

It would have been obvious for one of the ordinary skill in the art at the time of

the invention to modify Riddle in view of lexically scanning incoming data packets and

parsing the lexical tokens as in Tang. One would be motivated to include lexical

scanning of packets and parsing lexical tokens in Riddle because doing so would allow

the processor to read the specific lexical token relating to the control protocol layer that

the instruction belongs to rather than reading the whole instruction or packet and thus

creating faster communications medium and faster data routing.

As to claim 2, Riddle teaches scanning includes identifying an arithmetic

operation and performing said arithmetic operation (see col. 14 lines 5-8, the system

optionally keeps track of the number of bytes being scanned).

As to claim 4, Riddle teaches providing a set of regular expressions, each regular

expression having an associated class identifier (see Table. 3 and claim 1).

As to claim 12, Tang teaches scanning said incoming network data using lexical

token scanning of data stream (see abstract, statements in a program are lexically

scanned and parsed into a parse tree).

4.      Claims 3 and 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Riddle in view of Tang, further in view of Moreno, U.S. Patent No. 5,951,674.

As to claims 3 and 18, Riddle and Tang teach a method for classifying received

network data comprising scanning incoming data using lexical token scanning wherein

said network data is treated as a stream of input bytes, said network data being

organized into data packets, said scanning resulting in the identification of a data packet

belonging to one of a plurality of classes (see the rejection of claim 1).

~~Riddle and Tang do not teach the limitation "scanning includes identifying a skip~~

operation and in response thereto skipping over one or more subsequent input bytes".

However Moreno teaches identifying a skip operation and in response thereto skipping

over one or more subsequent input bytes (see claims 7 and 8).

It would have been obvious for one of the ordinary skill in the art at the time of

the invention to modify Riddle in view of identifying a skip operation and in response

thereto skipping over one or more subsequent input bytes as in Moreno. One would be

motivated to modify Riddle in view of identifying a skip operation and in response

thereto skipping over one or more subsequent input bytes because doing so would

allow the processor to detect an error in the stream of incoming data and skip to the

next data stream by detecting address of the beginning of the next incoming data

packet.

As to claim 19, Moreno teaches said number is specified by the value of a

current input byte (see col. 13).

As to claim 20, Moreno teaches said number is specified in a register (see col.

13).

As to claim 21, Moreno teaches detecting an operator indicating a value to be

saved in a register (see col. 13).

As to claim 22, Moreno teaches detecting an operator indicating a logical

operation to be performed on the contents of said register (see col. 13).

5.      Claims 5-7 and 9 are rejected under 35 U.S.C 103(a) as being unpatentable over

Riddle in view of Tang in further view of Del Monte, U.S. Patent No. 5,704,060.

As to claim 5, Riddle and Tang teach a method for classifying received network

data comprising scanning incoming data using lexical token scanning wherein said

network data is treated as a stream of input bytes, said network data being organized

into data packets, said scanning resulting in the identification of a data packet belonging

to one of a plurality of classes (see the rejection of claim 1).

Riddle and Tang do not teach the limitation "providing a DFA and recognizing

data packets using said DFA including transitioning from one state to another".

However, Del Monte teaches providing a deterministic finite automaton (DFA) (see col. 14 lines 21-31).

It would have been obvious for one of the ordinary skill in the art at the time of the invention to modify Riddle in view of including a DFA as in Del Monte including a representation of said lexical tokens as in Tang. One would be motivated to include a DFA including recognizing the lexical tokens using the DFA in Riddle because doing so would allow the DFA to determine the classification of the data packet and map an ordered sequence of input events into a corresponding sequence according to the control section of the data where the next state is uniquely determined by a single input event.

As to claim 6, Riddle teaches data packets are variable length data packets (see claim 1).

As to claim 7, Del Monte teaches said DFA is defined by a set of regular expressions (see col. 14 lines 21-31).

As to claim 9, Riddle teaches said states include one or more associated computer instructions wherein said computer instructions are executed in connection with transitioning to a state (see fig. 3 and its corresponding illustration).

6.      Claims 8,16 and 17 are rejected under 35 U.S.C 103(a) as being unpatentable over Riddle in view of Tang in further view of Del Monte in view of Eager et al., U.S. Patent No. 5,960,200 (referred to hereafter as Eager).

As to claims 8 and 16, Riddle, Tang, and Del Monte teach a method for classifying received network data comprising scanning incoming data using lexical

token scanning wherein said network data is treated as a stream of input bytes, said

network data being organized into data packets, said scanning resulting in the

identification of a data packet belonging to one of a plurality of classes providing a DFA

(see the rejection of claim 5).

The combined teachings of Riddle, Tang, and Del Monte do not teach the

limitation "producing a NFA and converting said NFA to produce said DFA)". However

Eager teaches producing a NFA and converting said NFA to produce said DFA (see col.

15 lines 51-67).

It would have been obvious for one of the ordinary skill in the art at the time of

the invention to modify Riddle in view of producing a NFA and converting NFA to

produce FDA because doing so would provide faster processing since processing of

DFA takes less time than processing NFA.

As to claim 17, Del Monte teaches reducing said DFA to a compressed form (see

col. 3 lines 56-67).

7.    Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Riddle in

view of Tang, in view of Del Monte further in view of Moreno.

Riddle and Tang teach a method for classifying received network data

comprising scanning incoming data using lexical token scanning wherein said network

data is treated as a stream of input bytes, said network data being organized into data

packets, said scanning resulting in the identification of a data packet belonging to one of

a plurality of classes (see the rejection of claim 1).

Riddle and Tang do not teach the limitation "some of said states further include a skip instruction". However Moreno teaches a skip instruction (see claims 7 and 8).

It would have been obvious for one of the ordinary skill in the art at the time of the invention to modify Riddle in view of identifying a skip operation and in response thereto skipping over one or more subsequent input bytes as in Moreno. One would be motivated to modify Riddle in view of identifying a skip operation and in response thereto skipping over one or more subsequent input bytes because doing so would allow the processor to detect an error in the stream of incoming data and skip to the next data stream by detecting address of the beginning of the next incoming data packet.

8.    Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riddle in view of Del Monte

As to claim 13, Riddle teaches a method for classifying data packets comprising the steps of providing one or more regular expressions, each having an associated class identifier, receiving plural data packets, each having a length not necessarily equal to one another, and for each data packet, determining a matching one of said regular expressions that matches said data packet, wherein said each data packet is classified according to the class identifier associated with said matching regular expression (see the rejection of claim 11).

Riddle doesn't teach the method of claim 1 wherein the method further including providing a deterministic finite automaton (DFA) representing said grammar graph.

However, Del Monte teaches providing a deterministic finite automaton (DFA) representing grammar graph (see col. 14 lines 21-31).

It would have been obvious for one of the ordinary skill in the art at the time of the invention to modify Riddle in view of including a DFA representing said grammar graph as in Del Monte. One would be motivated to include a DFA in Riddle because doing so would allow the network to map an ordered sequence of input events into a corresponding sequence according to the control section of the data where the next state is uniquely determined by a single input event.

As to claim 14, Del Monte teaches DFA is in compressed form (see col. 2 lines 48-56).

As to claim 15, Del Monte teaches compiling said regular expressions to produce said DFA (see col. 2 lines 48-56).

9.      Claims 30 and 37-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riddle in view of Tang in view of Del Monte, further in view of Boucher.

As to claim 30, Boucher teaches compiling second classification, configuring a programmable hardware packet classifier to classify said received packets, applying said data stream to said hardware packet classifier wherein data packets are classified according to said second classification rules (see claim 7, if the classification properties doesn't exist, a new classification class is created wherein the next incoming data packet is classified according to the already existing class and the new classes that has been created).

As to claim 37, Riddle, Tang and Del Monte do not teach the limitation "base memory, next state memory and base memory configured to contain address locations of said next state memory". However Boucher teaches method of protocol processing including a base memory, next state memory and base memory configured to contain address locations of said next state memory (see fig. 15A-C).

It would have been obvious for one of the ordinary skill in the art at the time of the invention to modify the combined teachings of Riddle in view of using a base memory, next state memory and base memory configured to contain address locations of said next state memory as in Boucher. One would be motivated to include a base memory in Riddle because doing so would allow DFA to determine the classification of the data packet and map an ordered sequence of input events into a corresponding sequence according to the control section of the data where the next state is uniquely determined by a single input event where the corresponding sequence is determined by the next state memory and the single input is determined by the base memory.

As to claim 38, Boucher teaches memories are random access memories (see fig. 15A).

As to claim 39, Boucher teaches said memories are read-only memories (see fig. 13 and its corresponding illustration).

As to claim 40, Riddle teaches a network data configured to provide a data packet comprising a stream of data (see claim 1 and fig. 1) and a memory system configured with data representing a class index corresponding to each of said

terminating states and configured to output a class index in response to production of said reached terminating state (see claim 7).

Riddle doesn't teach the limitation "a first system of memory configured with data representing DFA and configured to lexically scan said data stream".

However Tang Del Monte teaches a system of memory configured with data representing a DFA (see col. 14lines 21-31) and Tang teaches a system of logic circuits configured to lexically scan a data stream (see abstract, statements in a program are lexically scanned).

It would have been obvious for one of the ordinary skill in the art at the time of the invention to modify Riddle in view of decompression logic configured to scan data with DFA as in Del Monte and lexically scan data as in Tang. One would be motivated modify Riddle by using a memory configured with data representing DFA and lexically scan of data because doing so would allow the network to map an ordered sequence of input events into a corresponding sequence by scanning the lexical tokens according to the control section of the data where the next state is uniquely determined by a single input event.

As to claim 41, Riddle teaches a third memory configured to contain current state information for plural input channels (see claim 1 and fig. 1).

10.    Claims 23-29, 31-36 and 42-54 do not add any new limitations above claims 1-22 and claims 37-41 and therefore are rejected for similar reasons.

**11.**     Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Hussein El-chanti whose telephone number is (703)

305-4652. The examiner can normally be reached on Monday through Thursday from

8:00 am. – 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Ario  Etienne can be reached on (703)308-7562.  The fax phone numbers

for the organization where this application or proceeding is assigned are (703)746-9679

for regular communications and (703)746-9679 for After Final communications.

Any inquiry of a general nature relating to the status of this application or

proceeding should be directed to the receptionist whose telephone number is  (703)

305-3900.


Hussein El-chanti Fax #          (703) 746-9679
After Final Rejection Fax #      (703) 746-7238
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Hussein El-chanti

Date: 8/22/2003

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